

REMARKS/ARGUMENTS

Claims 2-22 are pending in this application. Claim 1 has been cancelled without prejudice. Claim 2 has been amended to more distinctly claim the subject matter which Applicants regard as the invention. The Applicants submit that no new matter has been added.

The Examiner interprets the terms “emulation” and “simulation” as a programmable signal generator and a world system. The Applicants disagree with this interpretation. Although it may be possible for a programmable signal generator to emulate the characteristics of some system or device, a programmable signal generator is not necessarily an emulator, and the terms are not synonymous. Also, it is not clear to the Applicants how the term “world system” is used by the Examiner to interpret either “emulation” or “simulation.” In any case, the word “simulation” was used only in claim 2, and the Applicants have amended claim 2 to delete use of the word “simulation” to simplify the issues under rejection.

With respect to the term “emulation,” the Applicants respectfully submit that it is an unambiguous term with a well understood common meaning, and in the claims it is used in accordance with that meaning. The term “emulate” means: “to duplicate one system or network element with another.” Harry Netwon, *Newton’s Telecom Dictionary*, 299 (20th ed. 2004). “Emulation” is simply “what happens [when] one gadget emulates another.” *Id.*, 300. In other words, an emulator is a device (or computer program) which can act as if it were a different device or

program. *Newton's Telecom Dictionary* uses as an example a computer program that runs on an Apple computer, which allows the Apple to emulate a PC running Windows, and thus allows Windows programs to run on the Apple machine. *Id.*, 299.

It is in this sense that the term emulation is used in the current invention. The invention is an emulator which can act as if it were one or more transmitters, one or more receivers, and/or a communication medium. It is used specifically to validate new modulator and demodulator designs in the design and prototyping of new communication systems. The invention is used by connecting it to the output of one or more modulators and to the input of one or more demodulators. The invention impresses distortion characteristics on a modulated baseband data signal (i.e., modulator output) between modulator and demodulator. The distortion characteristics reproduce the signal distortion that could be introduced by transmitters, receivers and/or communication medium under various conditions, without requiring actual transmitters, receivers or physical communication channel medium. The current invention thus introduces known signal impairments onto baseband signals, to assess their effect on new modulator and demodulator designs, in order to refine and improve the communication system design. In this way, the invention emulates transmitters, receivers and/or communication medium.

This is in stark contrast to the U.S. Patent No. 3,956,601 (Harris et al.). Harris teaches only a telecommunications analyzer for use in testing a system that has failed, but does not teach an emulator that can prevent a system failure by

improving the system design. The failure of an installed system is precisely what the current invention can prevent, but which Harris cannot prevent.

Claim Rejections - 35 USC § 102

In the Office Action, all claims (claims 1-22) are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 3,956,601 to Harris et al., referred to hereinafter as "Harris." After the amendment submitted herein claim 1 has been cancelled without prejudice and , claims 2-22 are pending.

The present invention is an emulator, which is configured by the user to behave as would transmitter(s), receiver(s) and/or a communications medium under various conditions. The invention can be used instead of those elements during the design, development and testing of new modulators and demodulators without requiring empirical evaluation. In contrast, Harris is directed to the monitoring and analysis (i.e., the empirical evaluation) of an actual existing nonperforming communication system, including communication medium (transmission line), actual modem integrity (presumably wherein the modem includes transmitter and receiver components in addition to modulator and demodulator components) and/or the interface (i.e., the connector) between the modem and the communication medium, when troubleshooting a nonperforming installation of existing production equipment.

The Examiner states that, as to claim 2, Harris teaches an emulator for modeling a plurality of signal impairments which manifest themselves onto a communication data signal between modulation and demodulation in a communication system, comprising a plurality of programmable transmit modules, a plurality of programmable receive modules, and a user interface communicating with a processor for defining a communication system [emulation]. The Applicants strongly disagree.

The Examiner first states that Harris teaches such an emulator comprising; in part, a plurality of programmable transmit modules emulating a plurality of signal impairments that occur during communication media modulation, each said transmit module having a signal input for coupling with a transmit modem, an output and a communication bus coupling (Harris column 10, lines 33-43). The Applicants disagree. Harris in column 10 lines 33-43 teaches a modem tester which tests the functionality of an installed modem by injecting into the modem increasing levels of noise until the modem eventually generates an error.

In contrast, each of the plurality of programmable transmit modules of the current invention receives a signal directly from the modulator component of a modem being designed, with no intermediate modem transmitter component. Each transmit module emulates a transmitter by introducing, as a transmitter would, signal impairments to the signal it receives from the modulator. The modem tester taught by Harris is not programmable, does not have a signal input that receives a

signal directly from a modulator component with no transmitter component, and cannot emulate one or more transmitters which introduce signal impairments onto a communication signal.

The Examiner then states that Harris teaches an emulator comprising in part a plurality of programmable receive modules emulating a plurality of signal impairments that occur during communication media demodulation, each said receive module having a signal input, an output for coupling with a receive modem and a communication bus coupling (Harris column 6 lines 43-56). The Applicants disagree. Harris in column 6 lines 43-56 teaches a transmitting telecommunication analyzer (10) and a receiving telecommunication analyzer (13) and their interaction when testing an actual transmission line between them. Both the transmitting analyzer and the receiving analyzer connect to the transmission line. The transmitting analyzer sends over the transmission line various test signals and the receiving analyzer recovers and analyzes those signals to test the condition of the transmission line, to determine if the transmission line introduces unknown impairments to a communication signal which exceed the performance specifications of an installed communication system, thereby causing the system to fail. column 6 lines 48-56 (continuing on through column 7 line 25) begins the description of a so-called "gain hit" test.

In contrast, each of the plurality of programmable receive modules of the current invention sends a signal directly to the demodulator component of a modem

being designed, with no intermediate receiver component. Each receive module emulates a receiver by introducing as a receiver would, signal impairments to the signal it sends to the demodulator. The transmitting and receiving telecommunications analyzer combination taught by Harris is not programmable, does not have a signal output that sends a signal directly to a demodulator component with no receiver component, and cannot emulate one or more receivers which introduce signal impairments onto a communication signal.

The Examiner next states that Harris teaches an emulator comprising, in part, a user interface communicating with a processor for defining a communication system simulation by soft coupling a required number of said transmit and receive modules in a user defined simulation arrangement using said transmit module outputs and said receive module inputs (Harris column 6 lines 56-65). The Applicants disagree. column 6 lines 56-65 of Harris continues the discussion of the transmission line test apparatus described above, further continuing through column 7 line 25 to complete the description of the "gain hit" test which lasts for 30 seconds, whereupon a "phase jitter" test is initiated. Harris fails to teach modules that emulate transmitters, receivers or a communication medium. Harris also fails to teach a user interface communicating with a processor for defining a communication system simulation, and soft coupling of a required number of transmit and receive modules in a user defined simulation arrangement.

The Examiner states that Harris teaches an emulator comprising, in part, a processor instructing each of said required modules via a communication bus to use specific signal impairments from said plurality of respective signal impairments for said user defined simulation arrangement (Harris column 10 lines 62-67, column 11 lines 1-36). The Applicants disagree. Harris in column 10 line 62 through column 11 line 36 teaches a pair of transmission line test analyzers operating in either manual mode or automatic mode. In manual mode any single line test may be selected by the user. In automatic mode the transmitting analyzer automatically sequences through each of nine test signals it is able to generate, and the receiving analyzer automatically monitors the response of the transmission line, to see if the transmission line introduces to the test signals unknown signal impairments exceeding the performance specifications of the communication system, thereby causing the system to fail. Harris fails to teach an emulator, or a processor, or transmit or receive modules as described above. Harris also fails to teach said processor instructing each of said required modules via a communication bus to use specific signal impairments from a plurality of respective signal impairments for user defined simulation arrangement. Therefore, claim 2 is not anticipated by Harris.

Claims 3-14 are dependent upon claim 2 and are believed to be allowable for the same reasons provided above for claim 2.

The Examiner states that, as to claim 15, Harris teaches an emulator for modeling at least one signal impairment which is manifest onto a communication data signal between modulation and demodulation in a communication system, the emulator comprising: at least one programmable transmit module emulating at least one signal impairment that occurs during communication media modulation, said at least one transmit module having a signal input for coupling with a transmit modem, an output and a processor interface; at least one programmable receive module emulating at least one signal impairment that occurs during communication media demodulation, said at least one receive module having a signal input, an output for coupling with a receive modem and a processor interface; and a processor, with associated memory, for configuring said transmit and receive modules via selected characteristics stored in memory.

The Applicants strongly disagree. As noted above, Harris teaches an analyzer for use in the monitoring and analysis (i.e., the empirical evaluation) of an installed but nonperforming communication system, testing the transmission line to see if it introduces unknown signal impairments to test signals, testing the integrity of a modem (i.e., whether it is working or not) and/or testing the operation of the interface between the modem and the transmission line. Harris does not teach the emulation of a transmitter, a receiver, a communication medium, or any other device or system. Harris fails to teach a programmable transmit module, and a programmable receive module, and a processor with associated memory for

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configuring said modules via selected characteristics stored in memory. Additionally, Harris fails to teach the emulation of known signal impairments manifest onto a communication data signal between modulation and demodulation in a communication system. Therefore, claim 15 is not anticipated by Harris.

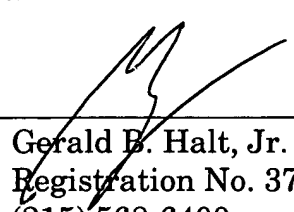
Claims 16-22 are dependent upon claim 15 and are believed to be allowable for the same reasons provided above for claim 15.

Conclusion

It is respectfully submitted that pending claims 2-22 are in condition for allowance. Accordingly, reconsideration and allowance of pending claims 2-22 are respectfully requested.

Respectfully submitted,

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